

2/2 026

UNCLASSIFIED

PROCESSING DATE—30OCT70

CIRC ACCESSION NO--AT0124385

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELEC. PROPERTIES AND RESISTOR
PARAMETERS OF SEVERAL ORG. SEMICONDUCTOR THERMISTORS. E.C.,
POLYMALONITRILE (I) OR POLYCYANAMIDE, WERE MARKEDLY DEPENDENT ON THE
PREPN. CONDITIONS AND TEMP. THE VOLTAGE CURRENT CHARACTERISTICS OF I
WERE PLOTTED. MOSK. INST. NEFTEKHIM. GAZOV. PROM. IM. GUBKINA,
MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.311.6:621.394/395

SERYAKOV, N.I., LUNIN, L.S.

"Experimental Study Of Transient Phenomena In A System Of Remote Supply Of Semiconductor Communication Apparatus"

Sb. nauch. tr. TsNII svyazi (Collection Of Scientific Works Of The Central Scientific-Research Institute Of Communications), 1971, No 1, pp 144-151 (from RZh:Elektrosvyaz', No 2, March 1972, Abstract No 2.64.48)

Translation: The conditions and results are considered of an experimental study of transient phenomena in a system of remote supply of the L-60p semiconductor apparatus, as well as a determination of the efficiency of operation of the means of maximum-zero protection. The study was directly conducted on one of the cable main lines with the use of industrial-type equipment. Summary.

1/1

1/3 029 UNCLASSIFIED PROCESSING DATE--300CT70
TITLE--KINETICS OF THE LOSS OF SILVER ATOMS ADSORBED ON SILICA GEL -U-
AUTHOR--(C4)--POPOVICH, G.M., LUNINA, YE.V., GOLUBEV, V.B., YEVDOKIMOV, V.B.
COUNTRY OF INFO--USSR
SOURCE--Zh. Fiz. Khim. 1970, 44(2), 517-20
DATE PUBLISHED--70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--SILVER NITRATE, SILICA GEL, CHEMICAL KINETICS, EPR SPECTRUM,
ADSORPTION, IRRADIATION, ISOTOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1999/1237

STEP NO--UR/0076/70/044/002/0517/0520

CIRC ACCESSION NO--AP0123199

UNCLASSIFIED

2/3 029

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--APG123199

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SAMPLES PREPD. BY SHAKING CARRIER WITH AGNO SUB3 SOLN. IN WATER FOR 3 HR, WERE WASHED WITH DISTO. WATER, DRIED AND IRRADIATED BY X OR GAMMA RAYS, AT MINUS 196DEGREES. SYNTHETIC SILICA GEL CORRESPONDING TO A SURFACE OF 660 M PRIME2-G AND ALUMINO SILICATE CNTG. AL SUB2 O SUB3 (12 AND 25PERCENT) CORRESPONDING TO THE SURFACES OF 400 AND 350 M PRIME2-G WERE USED AS CARRIERS. INDUSTRIAL SILICA GEL SAMPLES WERE ALSO USED. THE TEMP. WAS VARIED BY CHANGING THE TEMP. OF N SUB2 FLOWING THROUGH THE RESONATOR. EPR SPECTRA OF STABILIZED AG ATOMS ON THE SURFACE SHOWED 2 DOUBLETS OF ISOTOPES PRIME107 AG AND PRIME109 AG. CONSTS. OF HYPERFINE SPLITTING DECREASED IN THE CASE OF IRRADIATED SPECIMENS FROZEN IN SOLN. DOUBLETS WERE ALSO FOUND DURING IRRADN. OF AGNO SUB3 SOLN. HYPERFINE SPLITTING CONSTS. DEPEND UPON TEMP.; AT MINUS 170DEGREES, THEY DECREASED TO SIMILAR TO 40 OE. SPLITTING CONSTS. OF ATOMS STABILIZED ON THE SURFACE WERE INDEPENDENT OF TEMP. PERCENT RELATIVE CHANGE IN SPLITTING CONSTS. IS EXPRESSED AS $\Delta(\Delta E) - \Delta E_{\text{SUBFREE}}$ WHERE $\Delta(\Delta E)$ EQUALS $\Delta E_{\text{SUBFREE}}$ MINUS $\Delta E_{\text{SUBFREE}}$. $\Delta E_{\text{SUBFREE}}$ AND $\Delta E_{\text{SUBFREE}}$ ARE SPLITTING CONSTS. OF STABILIZED AND FREE ATOMS OF THE ISOTOPES BEING STUDIED. CHARACTERISTIC CURVES FOR THE LOSS OF AG ATOMS AT MINUS 140DEGREES ADSORBED ON SILICA GEL AND STABILIZED IN FROZEN SOLN. ARE GIVEN. THE EFFECTS OF TEMP. AND RATE OF MELTING ARE CONSIDERED. IT IS ASSUMED THAT DURING IRRADIATION, ENERGIZED TRAPS ARE FORMED IN THE CARRIER. DURING HEATING OF THE SPECIMEN, SOME OF THE ELECTRONS ARE SET FREE WHICH ARE RESPONSIBLE FOR THE REDN. OF SOME OF THE AG PRIMEPOSITIVE IONS TO AG ATOMS.

UNCLASSIFIED

3/3 029
CIRC ACCESSION NO--AP0123199
ABSTRACT/EXTRACT--FACILITY:
USSR.

UNCLASSIFIED

PROCESSING DATE--30OCT70

MOSK. GOS. UNIV. IM. LOMONOSOVA, MOSCOW,

UNCLASSIFIED

Adsorption

USSR

UDC 541.183

GORBACHEVA, R. B., and LUNINA, M. A., Moscow Institute of Chemical Technology imeni D. I. Mendeleev

"Electrolyte Adsorption From Nonaqueous Medium on Highly Dispersed Zinc"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 44, No 11, Nov 70, pp 2938-2940

Abstract: The conductometric method was used to study the adsorption of electrolytes from acetone solutions on highly dispersed zinc and the effect of the presence of the metallic phase on the state of the electrolytes. The concentration dependence of the equivalent conductance $\Lambda = f(c \%)$ is calculated for KI, KCNS, LiBr and compared with data calculated according to the Onsager equation. It is shown that the presence of the metallic phase causes a sharp drop in the equivalent conductance of the electrolyte solution. This drop is more pronounced for univalent than bivalent salts. The effect is due to ion adsorption on the particles of the highly dispersed zinc. The acetone solutions of the uni- and bivalent electrolytes display

1/2

USSR

GORBACHEVA, R. B., and LUNINA, M. A., *Zhurnal Fizicheskoy Khimii*,
Vol 44, No 11, Nov 70, pp 2938-2940

conductance anomalies in the region of the investigated concentrations. The concentration dependence for the univalent electrolytes shows significant deviations from the theoretically calculated dependence. The bivalent electrolytes show conductance an order below that of the univalent electrolytes at the same concentrations. These anomalies are due to the specifics of ion and molecule solvation in acetone and association phenomena.

2/2

USSR

UDC (546.824.41/43+546/831/4'41/43)5541.452

FEDOROV, N. F., KOZHEVNIKOVA, L. V., and LUNINA, N. M., Leningrad Technological Institute imeni Lensovet

"Synthesis and Properties of Materials Based on Titanates and Zirconates of Ca, Sr, Ba and Aqueous Acid Solutions"

Moscow, Neorganicheskiye Materialy, Vol 9 , No 10, Oct 73, pp 1773-1777

Abstract: Titanates and zirconates of alkaline-earth metals were synthesized in an attempt to produce binders of materials which possessed dielectric properties. It was shown that there is an advantage in using semi-dry pressing of powders of Ca, Sr, and Ba titanates and zirconates to produce materials with a good combination of high strength and good electrophysical properties. Materials were synthesized which had a compressive strength of 3600 and bend strength of 500 kg/cm². Electrical properties of the investigated composites were within the following limits: resistance -- 10⁷-10¹¹ ohm-cm; tg δ = 0.05-0.1, ϵ = 15-800. Zirconates of alkaline-earth elements were stable to temperature effects up to 1000°C. A new and highly effective compound for producing parts of oxide compounds was a mixture of sulfuric and phosphoric acids where the best results were achieved at a content of the initial acids of 40-60% H₃PO₄ and 60-40% H₂SO₄. Three figures, two tables, five bibliographic references.

1/1

Automatic Control: Instruments

USSR

UDC: 621.317:681.26

VIKTOROV, V. A., Doctor of Technical Sciences, LUNKIN, B. V., Candidate of Technical Sciences, VOSTRIKOV, I. S., Engineer, FEDOROV, A. V., Engineer

"A Resonance Volume Gauge for Liquids and Dry Pourable Materials"

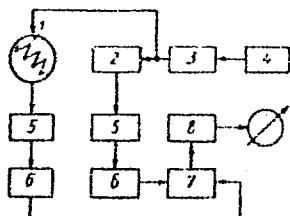
Moscow, Pribory i Sistemy Upravleniya, No 4, Apr 72, pp 26-27

Abstract: The paper describes a new method of volume measurement developed at the Institute of Problems of Control in Moscow. The procedure is based on using the resonance properties of electromagnetic systems with distributed parameters. The resonance frequency of such a system is an indirect parameter which characterizes the amount of material contained in the system. The pickup is made in the form of a continuous thin line uniformly distributed throughout the volume of the vessel whose contents are to be measured. The resonance frequency of the system formed by the line and the metal walls of the vessel is independent of the distribution of material filling the vessel. Expressions and curves are given for the resonance frequency of the system as a function of relative volume (the ratio of the volume of material to the volume of the vessel). Measurement error is $\pm 1\%$. A block diagram of the volume gauge is shown in the figure.

1/2

USSR

VIKTOROV, V. A. et al., Pribory i Sistemy Upr., No 4, 1972, pp 26-27



1--pickup; 2--reference tank circuit;
3--high-frequency wobulator; 4--low-
-frequency square pulse generator;
5--detector; 6--shaping stage; 7--
flip-flop; 8--integrating circuit

2/2

- 6 -

1/2 013 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--DOMAINS OF APPLICATION OF HIGH FREQUENCY METHOD OF MEASURING LEVEL
AND VOLUME -U-
AUTHOR-(02)-VIKTOROV, V.A., LUNKIN, B.V. L
COUNTRY OF INFO--USSR
SOURCE--AVTOMATIKA I TELEMEXHANIKA, 1970, NR 5, PP 199-203
DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., PHYSICS
TOPIC TAGS--ELECTRIC CONDUCTIVITY MEASUREMENT, HIGH FREQUENCY CURRENT,
DIELECTRIC MATERIAL

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1993/0920 STEP NO--UR/0103/70/000/005/0199/0203
CIRC ACCESSION NO--AP0113755
UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0113755

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT, THERE IS STATED A METHOD OF DETERMINING THE DOMAIN OF THE APPLICATION OF THE HIGH FREQUENCY METHOD OF MEASURING THE LEVEL AND THE VOLUME, THE METHOD CONNECTED WITH THE DETERMINATION OF THE DEPENDENCE OF THE SYSTEM QUALITY ON THE ELECTROMAGNETIC PROPERTIES OF THE MEDIA MEASURED. THERE ARE SUGGESTED THE RECOMMENDATIONS CONCERNING THE CHOICE OF THE PERMISSIBLE VALUES OF THE ELECTROCONDUCTIVITY OF DIELECTRIC AND ELECTROCONDUCTIVE MEDIA MEASURED.

UNCLASSIFIED

172 029 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--STRUCTURE AND COLOR OF ALUMOCALCIUM TYPES OF GLASS -U-
AUTHOR--(04)-VEYNBERG, T.I., GALIMOV, D.G., LUNKIN, S.P., YUDIN, D.M.
COUNTRY OF INFO--USSR
SOURCE--LENINGRAD, OPTIKO MEKHANICHESKAYA PROMYSHLENNOST', NO 1, 1970, PP
42-47
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--IR SPECTROSCOPY, GLASS STRUCTURE, ALUMINUM OXIDE, CALCIUM
GLASS, SILICATE GLASS, PHOSPHATE GLASS, CHROMIUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1999/1343

STEP NO--UR/0237/70/000/001/0042/0047

CIRC ACCESSION NO--AP0123301

UNCLASSIFIED

2/2 029

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0123301

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INFRARED SPECTROSCOPY, OPTICAL, AND PARAMAGNETIC INDICATOR METHODS ARE USED IN STUDYING THE STRUCTURE OF ALUMOCALCIUM TYPES OF GLASS. IT IS SHOWN THAT THE PRESENCE OF TWO TYPES OF STRUCTURAL UNITS CHARACTERIZE THE INVESTIGATED VITREOUS MATRIX: (ALU SUB1) AND (ALU SUB6). ON THE BASIS OF RESULTS OBTAINED FROM STUDYING THE ABSORPTION SPECTRA OF ALUMOCALCIUM TYPES OF GLASS COLORED BY IONS OF RARE EARTH METALS AND VARIABLE VALENCY METALS, IT IS SHOWN THAT THE DEGREE OF COVALENCY OF THE CHEMICAL ACTIVATOR LIGAND BONDS AND FIELD FORCE ARE HIGHER FOR ALUMOCALCIUM TYPES OF GLASS THAN THEY ARE IN SILICATE AND PHOSPHATE GLASS. NEW VALENCE STATES ARE OBTAINED AND STUDIED FOR CHROMIUM (TETRAVALENT AND PENTAVALENT CHROMIUM).

UNCLASSIFIED

USSR

UDC 532.5

LEONT'YEVA, N. V., LUN'KIN, YU. P., FURSENKO, A. A., Leningrad

"Flow around Blunt Bodies by a Nonequilibrium-Ionized Radiating Gas"

Novosibirsk, Fizika Goreniya i Vzryva, Vol 9, No 5, 1973, pp 653-658

Abstract: A study is made of hypersonic flow of a nonequilibrium-ionized mono-atomic nonviscous radiating gas around a spherical blunt body taking into account the leading radiation. In calculating the flow parameters the system of gas dynamic equations was solved jointly with the equations of radiation transfer. In the range of the investigated parameters, consideration of the resonance radiation has a weak effect on the position of the shock wave and the gas dynamic fields in the shock layer. As a result of the comparatively low recombination rate, the degree of ionization on the upper beams can significantly exceed the corresponding equilibrium values. The study includes a discussion of the kinetics of ionization and radiation in the shock layer, the calculation of the parameters in the heated layer, and the method of solution. The solution technique is reduced to binary iterations just as was previously done by M. D. Kremenetskiy, et al. [PMTF, No 4, 1971].

1/1

USSR

UDC 537.56.533.7

GAVIN, L. B., LUN'KIN, Yu. P., Leningrad

"Flow a Non-Equilibrium Ionized Radiating Gas Around a Body Considering the Temperature Difference Between Electrons and Ions"

Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki, No 1, 1972, pp 9-14.

Abstract: The flow is studied along the zero flow line during hypersonic flow around an axisymmetrical blunt body by a stream of a non-equilibrium ionized, monatomic, non-viscous radiating gas considering the difference in temperatures between the electron and atom-ion gases. The excitation of atoms due to collisions with the electrons and their subsequent ionization are considered, as well as photo ionization. Since the separation of the shockwave is slight in comparison to the characteristic size of the body, the radiative transfer equation is written in the approximation of a locally homogeneous flat layer. The influence of parameters of the incident stream on the field of flow across the shockwave and the distribution of radiation heat flux is studied.

1/1

USSR

KOLESKO, S. B. and LUN'KIN, Yu. P., Leningrad Polytechnic Institute imeni M. I. Kalinin

"The Laminary Boundary Layer in Calculating Oscillatory-Dissociation Relaxation of Gases and of Surfaces With Uneven Catalytic Properties"

Kiev, Gidromekhanika, No 20, 1972, pp 19-24

Abstract: During hypersonic motion of a body, sharp heating of the surrounding gas during passage through the main shock wave, and deceleration (braking) within the boundary layer both lead to excitation of oscillatory degrees of freedom and molecular dissociation, while at high temperatures durations of the processes become commensurable. In the general case of a multicomponent mixture, the simultaneous occurrence of oscillatory and dissociation relaxation should be considered in the study of nonequilibrium processes.

The authors had earlier (1967) obtained a closed system of equations describing the motion of a multicomponent mixture of viscous heat-conducting gases with simultaneous appearance of oscillatory and dissociation relaxation. In the present study, equations of the laminary boundary layer are derived from general equations by the usual method; and for a diatomic gas in the absence
1/2

USSR

KOLESKO, S. B. and LUN'KIN, Yu. P., *Gidromekhanika*, No 20, 1972, pp 19-24

of mass forces and thermal diffusion, an initial system of equations for plane steady motion is formulated. Formulas for various contributory factors are derived, and illustrated graphically.

It is concluded that the distribution of oscillatory temperature in the boundary layer is of complex character, this being explained as the effect of dissociation on relaxation of oscillatory degrees of freedom; also, that oscillatory relaxation leads to retardation of dissociation relaxation. Despite the fact that with oscillatory-dissociation relaxation temperature is higher than in the case of dissociation relaxation alone, specific dissociation velocities in the authors' study remained smaller.

2/2

- 19 -

USSR

UDC 532.517.2

KOLESHKO, S. B., LUNKIN, YU. P.

"Laminar Boundary Layer in a Plate with Arbitrary Catalytic Properties in the Presence of Oscillatory-Dissociation Relaxation of a Gas"

Trudy Leningradskogo Politekhnicheskogo Instituta, Aerotermodinamika
(Works of the Leningrad Polytechnical Institute Aerothermodynamics),
No 313, 1970, pp 5-12

Translation: This article contains a study of the laminar boundary layer in a plate with arbitrary catalytic properties in the presence of oscillatory-dissociation relaxation of a gas.

The semiphenomenological derivation of the boundary conditions for concentrations and mean oscillatory energies of the components of the mixture is presented. The finite-difference method was used to obtain the solution of the boundary layer equations with corresponding boundary conditions in a diatomic gas. The effect of catalytic surface activity with respect to oscillatory relaxation has been investigated in detail. Data are presented on the distribution of the progressive and oscillatory

1/2

USSR

KOLESKO, S. B., et al., Trudy Leningradskogo Politekhnikheskogo Instituta, Aerotermodinamika (Works of the Leningrad Polytechnical Institute Aerothermodynamics), No 313, 1970, pp 5-12

atomic temperatures and concentrations in the boundary layer. There are 4 illustrations and a 6-entry bibliography.

2/2

- 14 -

1/2 061 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--VIBRATIONAL DISSOCIATION RELAXATION IN THE AIR FLOW BEHIND A DIRECT
SHOCK WAVE -U-
AUTHOR--(02)-GGLOVACHEV, YU.P., LUNKIN, YU.P. L
COUNTRY OF INFO--USSR
SOURCE--AKADEMIYA NAUK SSSR, IZVESTIYA, MEKHANIKA ZHIDKOSTI I GAZA,
JAN.-FEB. 1970, P. 48-52
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--AIR FLOW, SHOCK WAVE, SHOCK WAVE PHYSICS, CHEMICAL REACTION,
VIBRATION RELAXATION, DISSOCIATION, QUANTUM CHEMISTRY, THERMAL SHOCK,
MOLECULE, RELAXATION PROCESS, MATHEMATIC EXPRESSION, ENERGY THEORY,
NITROGEN, NITROGEN OXIDE, OXYGEN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FKAME--1992/1790

STEP NO--UR/0421/70/000/000/0048/0052

CIRC ACCESSION NO--AP0112776

UNCLASSIFIED

2/2 061

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0112776

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DERIVATION OF EXPRESSIONS FOR THE PROBABILITY OF OCCURRENCE OF CHEMICAL REACTIONS AND VIBRATIONAL RELAXATION TIMES, ASSOCIATED WITH THE EXCHANGE IN QUANTA OF THERMAL VIBRATIONS AMONG MOLECULES. THE EXPRESSIONS OBTAINED ARE USED IN COMBINATION WITH KOLESKO'S ET AL. (1967) RELAXATION EQUATIONS TO ANALYZE THE AIR FLOW BEHIND A DIRECT SHOCK FRONT IN THE PRESENCE OF VIBRATIONAL DISSOCIATION RELAXATION. THE INFLUENCE OF VIBRATIONAL RELAXATION ON THE CHEMICAL REACTION RATE AND THE INFLUENCE OF THE RATE OF DISSOCIATION RELAXATION ON THE CHANGES IN THE MEAN VIBRATIONAL ENERGY OF MOLECULAR COMPONENTS AND ON THE EXCHANGE IN QUANTA OF THERMAL VIBRATIONS ARE TAKEN INTO ACCOUNT. THE CALCULATIONS REVEAL A SUBSTANTIAL INFLUENCE OF VIBRATIONAL RELAXATION AND OF EXCHANGE IN QUANTA OF THERMAL VIBRATIONS BETWEEN OXYGEN, NITROGEN, AND NITROGEN OXIDE MOLECULES ON THE FLOW PARAMETERS.

UNCLASSIFIED

SPRS 59008

6-73

4

VI-3 EFFECT OF SOME GAS DYNAMIC FACTORS IN THE SOURCE ZONE ON THE GROWTH PROCESSES OF EPITAXIAL LAYERS OF CALCIUM ARSENIDE IN THE CHLORIDE SYSTEM

Article by A. A. HAYASHI, G. B. LUN'KINA, S. S. STREL'CHENKO, V. V. LABEDEV, KATUKA, ROYKOBLIN, I. I. Stroitel'stvo i Sposoby 1972, No. 1, p. 72.

The growth of epitaxial layers of tellurium arsenide in a chloride flow system [eq. 4 and 5] is determined to a significant degree by the processes taking place in the source zone.

Under the assumption that the mass delivery of the components of the vapor-gas mixture to the surface of the source takes place as a result of molecular diffusion, a quantitative calculation was made of the degree of completion of the interaction of the vapor-gas flow in a broad range of variation of the linear velocities. The experimental results obtained satisfactorily coincided with the calculated results.

The equations of thermodynamic equilibrium in the source zone were compiled and calculated on a computer taking into account the degree of completeness of the interaction [6]. The partial pressures of the components of the vapor-gas mixture were calculated to a broad temperature range for $\beta = 0.1, 0.2, 0.3, \dots, 0.9, 1$.

A study was made of the effect of the degree of completeness of the interaction on the composition of the gas phase in the crystallization zone and the growth rate of the epitaxial layers.

USSR

UDC:669.018.95:537.311

DYADENKO, N. S., LUN'KO, A. I. and KHOLOPTSEVA, T. V., "Radiopribor"
Plant, Kiev

"Electrical Resistance of Copper-Graphite Powder Compositions"

Kiev, Poroshkovaya Metallurgiya, No 12, Dec 73, pp 62-66

Abstract: This article studies the change in electrical resistance during the process of pressing of copper-graphite powder compositions with "open" graphite and graphite covered with copper. For comparison, experiments were also performed with pure copper. Furthermore, the evenness of distribution of the components in pressings produced at the greatest pressures was determined. The change in resistivity of copper-graphite compositions during the process of their pressing shows that a sharp reduction in resistivity of all compositions studied is observed at pressing pressures of 1.2-1.6 t/cm², while resistivity decreases more smoothly above this pressure. Compositions containing graphite granules clad with copper have significantly lower resistivity than compositions with "open" graphite, as a result of the formation of a solid copper framework in the first case, and a graphite frame in the second.

1/1

- 48 -

Waveguides

USSR .

UDC 621.372.8

LUN'KOV, A. YE., LYAKHOVETSKIY, B. A.

"Analysis of the Operation of a Prism Power Divider in Multimode Wave Guides"

Gor'kiy, Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, Vol XIV, No 12, 1971, pp 1902-1905

Abstract: A study was made of the passage of a plane electromagnetic wave through two dielectric 45° prisms placed at the cross of multimode wave guides. Relations are obtained for the transmission coefficients of the wave in each of the arms of the device as a function of the width of the gap between the prisms considering internal reflections from the faces of the prisms and the specific nature of variation of the gap in the wave guides. The calculated relations were checked experimentally on wavelengths of 2.2 and 4 mm. Satisfactory approximation of the characteristics of the prism power divider by the relations calculated for the plane electromagnetic wave polarized perpendicularly to the plane of incidence on the diagonal face of the prism occurs with an increase in the wave guide cross section by no less than 10 times by comparison with the basic dimensions. Increasing the dielectric constant of the prism improves the indicated approximation, for as a result of decreasing the wavelength in the prism by $\sqrt{\epsilon}$ times, the wave incident on the diagonal face

1/2

SSSR .

LUN'KOV, A. YE., et al., Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika,
Vol XIV, No 12, 1971, pp 1902-1905

better approximates a plane wave. The effect of the internal reflections, which increase with an increase in the dielectric constant of the prism, can be considered on the basis of the presented procedure. The interference nature of the relation $D(d/\lambda)$ caused by the specific nature of variation of the gap between the prisms placed in the wave guides permit power division to be obtained with high directionality.

2/2

- 112 -

USSR

UDC 537.311.33

BILENKO, D. I., LUN'KOV, A. Ye., ORNATSKAYA, Ye. M., and TSIPORUKHA, V. D.

"Interaction of Millimeter and Submillimeter Radiation with Semiconductor Materials"

Tr. NII Introskopii (Works of the Scientific-Research Institute for Introsopes), 1970, Issue 4, pp 61-62 (from RZh-Elektronika i yeye primeneniye, No 9, September 1971, Abstr-ct No 9B27)

Translation: A calculation is made of the reflection coefficient of the electromagnetic radiation from nondegenerate semiconductor materials for various scattering mechanisms of charge carriers. The results of the calculation show the correctness of a description of the properties of materials in the millimeter and submillimeter bands based on simplified semiclassical relations for a complex dielectric constant. Summary.

1/1

1/2 042 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--MEASUREMENT OF THE REFLECTION FACTOR MODULUS AND PHASE IN
SEMICONDUCTORS IN THE MILLIMETER WAVELENGTH RANGE -U-
AUTHOR--(03)-BILENKO, D.I., LUNKOV, A.YE., YAZIKOV, V.N.
COUNTRY OF INFO--USSR
SOURCE--BORKIY, IZVESTIYA VUZOV SSSR RADIOFIZIKA, VOL. 13, NO. 3. 1970, PP
453-461
DATE PUBLISHED-----70
SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., METHODS AND EQUIPMENT,
PHYSICS
TOPIC TAGS--SEMICONDUCTOR PROPERTY, MILLIMETER WAVE, NONDESTRUCTIVE TEST,
ELECTRONIC MEASUREMENT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3003/1956 STEP NO--UR/0141/70/013/003/0453/0461
CIRC ACCESSION NO--AP0130738
UNCLASSIFIED

2/2 042

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0130738

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESEARCH INTO SEMICONDUCTOR CHARACTERISTICS IN THE MILLIMETER WAVELENGTH RANGE IS USEFUL IN THE DESIGN OF CONTACTLESS, NONDESTRUCTIVE METHODS FOR MEASURING SEMICONDUCTOR PARAMETERS. ESPECIALLY IMPORTANT ARE MEASUREMENTS OF THE MODULUS AND PHASE OF THE COEFFICIENT OF REFLECTION SINCE THESE QUANTITIES ARE CLOSELY CONNECTED WITH THE FUNDAMENTAL ELECTROPHYSICAL PARAMETERS OF THE SEMICONDUCTORS. THE AUTHORS WARN, HOWEVER, THAT METHODS FOR MEASURING THESE QUANTITIES IN THE CENTIMETER BAND DO NOT GIVE THE REQUIRED DEGREE OF ACCURACY WHEN APPLIED TO THE MILLIMETER BAND. MEASUREMENT ERROR IN THE MILLIMETER BAND WAS NO MORE THAN ONE PERCENT FOR THE MODULUS, AND PLUS OR MINUS ONE PERCENT FOR THE PHASE. THE SAME METHOD OF MEASUREMENT IS APPLICABLE TO LOW ALLOYED GAAS SPECIMENS IN THE TWO MILLIMETER BAND. A BLOCK DIAGRAM OF THE MEASURING EQUIPMENT IS GIVEN.

UNCLASSIFIED

USSR

UDC: 621.382

BILENKO, D. I., LUN* KOV, A. Ye., YAZIKOV, V. N.

"Measurement of the Reflection Factor Modulus and Phase in Semiconductors in the Millimeter Wavelength Range"

Gorkiy, Izvestiya VUZov SSSR Radiofizika, Vol. 13, No. 3, 1970, pp 453-461

Abstract: Research into semiconductor characteristics in the millimeter wavelength range is useful in the design of contactless, nondestructive methods for measuring semiconductor parameters. Especially important are measurements of the modulus and phase of the coefficient of reflection since these quantities are closely connected with the fundamental electrophysical parameters of the semiconductors. The authors warn, however, that methods for measuring these quantities in the centimeter band do not give the required degree of accuracy when applied to the millimeter band. Measurement error in the millimeter band was no more than one percent for 1/2

- 54 -

USSR

UDC: 621.382

EILENKO, D. I., et al, Izvestiya VUZov SSSR Radiofizika, Vol. 13, No. 3, 1970, pp 453-461

the modulus, and plus or minus one percent for the phase. The same method of measurement is applicable to low-alloyed GaAs specimens in the two-millimeter band. A block diagram of the measuring equipment is given.

2/2

LUN'KOV, I. F.

Social Science & Health

CONSULTANT SERVICES IN THERAPEUTIC AND PROPHYLACTIC INSTITUTIONS OF
CHUVASH ASSR

UDC: 614.234.4(470.344-2)

Article by I. F. Lun'kov, scientific organization department headed by
Professor S. M. Ushakov (Chuvash ASSR), All-Union Scientific Research Institute of
Social Hygiene and Public Health Organization named N. A. Semashko, Moscow;
Moscow, Sovetskoye Zdravookhraneniye, Russian, No 10, 1972, submitted
10 May 1972, pp 17-22

The program adopted by the 22nd Congress of the CPSU, the decision
of the 23rd and 24th congresses of the CPSU set forth objectives that
would fully meet the requirements of urban and rural inhabitants in all
types of highly qualified medical care. In view of the rapid development
of the national economy a change is occurring in the proportion between
urban and rural population, and, at the same time, in medical care require-
ments.

The material-technical base of public health has become considerably
stronger in rural areas in the last ten years. In many regions large insti-
tutions where the rural population receives competent specialized medical care.
In addition, some of the people turn to republican, kray, and oblast hospitals
for care in a narrow special field.

In view of the importance of bringing the level of medical care in rural
areas up to that of urban areas, our objective was to investigate the scope
and structure of consultant services to the people of different regions,
according to the data of the republic's therapeutic and prophylactic
institutions. For this purpose we used current reported data, filling out
a specially developed card for each request for service made by a patient
from a given region of Chuvash ASSR in a consultant polyclinic (dispensary)
in 1968. In addition we excerpted data from the outpatient charts of
therapeutic institutions and departments of emergency and scheduled
consultation in the republican hospital. After expert evaluation of the
quality of filling out the cards, they were alphabetized, coded, and
processed at the computer station in accordance with the prepared program
of the study. For all of 1968, there were 34,596 recorded visits to
the republic's therapeutic and prophylactic institutions from different
regions and cities, with the exception of the republican center; this included
4,307 (14.2%) visits to consultants at such institutions.

URS 57493
13 MAY 72

- 20 -

USSR

UDC 531.383

LUNTS, Ya. L., KHABALOV, V. V.

"Measurement of Angular Velocity of a Flight Vehicle by Linear Accelerometers"

Priborostroyeniye, No 12, 1971, pp 73-76.

ABSTRACT: This article presents the equations of motion of the sensing masses of accelerometers moving in relationship to a system of coordinates coupled to a flight vehicle. Algorithms for calculation of components of the angular velocity of the apparatus are produced from the equations of motion. The accuracy of measurement of kinematic parameters depends essentially on the nature of changes in the components of angular velocities and accelerations. High accuracy can be achieved if these quantities are slowly changing functions of time.

1/1

- 128 -

Coatings

USSR

UTC: 621.357.7

MOISEYEV, V. P., and LUNYATSKAS, A. M., Institute of Physical Chemistry,
Academy of Sciences, USSR

"Structure and Certain Properties of Chemically Deposited Nickel-Copper-
Phosphorus Coatings"

Moscow, Zashchita Metallov, Vol 6, No 2, Mar-Apr 70, pp 186-190

Abstract: The structure, phase transformations, hardness, and magnetic characteristics of Ni-Cu-P coatings produced by chemical reduction with the use of hypophosphite from alkaline solutions have been studied both in the initial condition and after heat treatment in vacuum at 150--600°C. In the initial state, Ni-Cu-P coatings constitute a substitutional solid solution of copper and phosphorus in a lattice of cubic face-centered β -nickel. Due to the opposite effect of phosphorus, the nickel lattice constant appears to be understated as compared to that rated for the given copper content. In the specimens studied, the distortion of the lattice of the β -solid solution decreased with the increase of copper. The properties of the coatings both in the initial condition and after heat treatment are given in the original article.

1/1

USSR

UDC: 669.293.5:621.785(088.8)

PROKOSHKIN, D. A., VASIL'YEVA, Ye. V., TRET'YAKOV, V. I., LUPAKOV, I. S.

"Method of Heat Treatment of Niobium and its Alloys"

USSR Author's Certificate Number 352882, Filed 18/06/71, Published 27/02/73
(Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No 81871).

Translation: This method, including annealing, differs in that in order to increase the elastic properties before annealing cold plastic deformation is conducted with compression greater than 50%, and annealing is performed at 500-900°. Unalloyed Nb, treated by this method, has an elastic limit of 56 kg/mm².

1/1

- 20 -

USSR

UDC 621.785.661.65

KUZ'MICHEV, Yu. S., LUPAKOV, I. S., BOROK, B. A., and GAVRILOVA, V. K.,
Central Scientific Research Institute of Ferrous Metallurgy imeni I. P.
Bardin

"Investigation of the Effect of Boron on the Thermal Conductivity and Thermal
Expansion of Titanium"

Kiev, Poroshkovaya Metallurgiya, No 8, Aug 70, pp 78-82

Abstract: Results are presented of an investigation of the effect of boron on thermal conductivity and linear expansion of titanium. The investigation was carried out by the comparative method using samples containing 1, 2, 3, and 4 wt. % boron. Boron increased the thermal conductivity of titanium. The thermal conductivity of titanium with boron, derived experimentally was somewhat higher than the rated one based on the heterogeneity of the alloy and if it is considered that the alloy consists of a solid boron solution in titanium and titanium diborides. The coefficient of linear expansion of titanium decreased appreciably with the introduction of boron into it.

1/1

- 71 -

USSR

UDC 621.039.553.36:620.193.47.4

GERASIMOV, V. V., GROMOVA, A. I., ~~LURAKOV, I. S.~~, MOROZOVA, I. K.,
BAKULEVSKIY, A. A., BELOUS, V. N., and KOLESOV, B. I.

"Corrosion and Electrochemical Behavior of Carbon Steels Under Quasi-reactor Conditions"

Moscow, Atomnaya Energiya, Vol 28, No 1, Jan 70, pp 13-18

Abstract: The article describes results of a study of the corrosion and electrochemical behavior of steels of the perlitic class in water at 300° C at various oxygen concentrations (0.02-40 and 1000 mg/kg) at pH = 7-10, as well as a study of the effect of reactor irradiation on the corrosion processes of perlitic steels. The corrosion and electrochemical tests were staged under static and dynamic conditions. The perlitic steels studied included St. 20 (C 0.17%; Cr 0.25%; Ni 0.25%; Mn 0.35%; Si 0.17%); 12KhM (C 0.12%; Cr 0.94%; Mn 0.59%; Si 0.3%; Mo 0.4%); and 16GNM (C 0.18%; Ni 1.41%; Mn 1.18%; Si 0.23%; Mo 0.26%). Specimens of stainless steel Kh18Ni9Ti (C 0.08%; Cr 17.19%; Ni 9.11%; Mn 1.2%; Si 0.8%; Ti 0.6%) were comparison-tested.

1/2

USSR

GERASIMOV, V. V., et al., Atomnaya Energiya, Vol 28, No 1, Jan 70, pp 13-18

It was found that in demineralized water at 300° C an increase in the oxygen concentration from 0.02 to 40 mg/l increases the corrosion rate of perlitic steels, with pitting corrosion developing with a pit depth of up to 0.1 mm. In oxygen-containing water under static conditions a complex dependence of anodic process rate on potential is observed in steels of the perlitic class. In demineralized de-aerated water an increase in the pH to 10 (by introducing ammonia) results in a decrease in the corrosion rate, with no development of pitting corrosion being observed. Irradiation reduces the corrosion resistance of the steels during the initial testing period. The corrosion rate under irradiation decreases with an increase in exposure time, and after 3500 hours of tests the corrosion rate for the perlitic steels is practically the same with or without irradiation.

2/2

Acc. Nr:

AP0042127

Abstracting Service:

NUCLEAR SCI. ABST. H-70

Ref. Code:

UM0089

12371 CORROSION AND ELECTROCHEMICAL BEHAVIOR
OF CARBON STEELS UNDER CONDITIONS SIMILAR TO THOSE
IN REACTOR OPERATION. Gerasimov, V. V.; Gromova, A. I.;
Lupakov, I. S.; Morozova, I. K.; Bakulevskii, A. A.; Belou, V. N.;
Kolesov, B. I. At. Energ. (USSR): 28: 13-18(Jan 1970). (In
Russian).

The corrosion and electrochemical behavior of carbon steels
was studied in water at 300°C with oxygen concentrations equal
to 0.02 to 40 and 1000 ppm. The samples of carbon steels, ir-
radiated in the reactor and non-irradiated samples were tested
under static and dynamic conditions. The increase of oxygen
concentration in water intensified corrosion of carbon steels.
Irradiation reduced steel corrosion resistance during the initial
test period. (auth)

pc

REEL/FRAME
19760028

18

112 022 UNCLASSIFIED DOCKETING DATE 1000070
TITLE--THE CLINICO PSYCHOPATHOLOGICAL FEATURES OF ATTACKLIKE SCHIZOPHRENIA
IN CHILDREN AND ADOLESCENTS, REPORT 1. PERIODICAL FORM -U-
AUTHOR--LUPANDIN, V.M.
COUNTRY OF INFO--USSR L
SOURCE--ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA, 1970,
VOL 70, NR 3, PP 425-430
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--SCHIZOPHRENIA, PEDIATRICS
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1982/0804 STEP NO--UR/0246/70/070/003/0425/0430
CIRC ACCESSION NO--AP0052240
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--18SEP70

2/2 022

CIRC ACCESSION NO--AP0052240
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE AUTHOR REPORTS OF A FOLLOW UP STUDY OF PERIODICAL FORMS OF SCHIZOPHRENIA IN CHILDREN AND ADOLESCENTS (54 CASES). IN PERIODICAL SCHIZOPHRENIA OF CHILDHOOD (8 TO 9 YEARS) THE ENCOUNTERED ATTACKS ARE SIMILAR TO THOSE SEEN IN ADULTS. HOWEVER THEY ARE MORE ELEMENTARY IN THE PSYCHOPATHOLOGICAL STRUCTURE, THERE ARE NO DELUSIONS OF SIGNIFICANCE SO FREQUENTLY SEEN IN ADULTS, NO FANTASTICAL DELUSIONS OF PHENOMENA OF PSYCHIC AUTOMATISMS. THE ATTACKS ARE CHARACTERIZED BY MORE EXPRESSED MOTOR AND SENSORIAL DISTURBANCES. THE ATTACKS PROPER ARE SHORTER THAN IN ADULT PATIENTS. ATTACKS OF PERIODICAL SCHIZOPHRENIA IN ADOLESCENCY (BEGINNING FROM 13 YEARS OF AGE) MORE RESEMBLE THOSE OF THE ADULTS, WITH THE EXCEPTION THAT DELUSIONAL STATES HAVE MORE FREQUENTLY A REDUCED CHARACTER WHILE AS MOTOR AND SENSORIAL DISORDERS, AS WELL AS DISORDERS RELATED TO REFLEXIA ARE EXPRESSED MUCH MORE GROSSLY.

UNCLASSIFIED

Acc. Nr: **AP0047178**

Ref. Code: UR 0246

PRIMARY SOURCE: Zhurnal Nevropatologii i Psikiatrii, 1970,
Vol 70, Nr 2, pp 254-261

PARAPHRENIC STATES IN REMITTENT SCHIZOPHRENIA
OF ADOLESCENCY

V. M. Lupandin and St. Stoyanov

Among the 200 patients with recurrent forms of schizophrenia and an onset at 8—16 years, there were 50 cases where the disease was manifested by attacks with paraphrenic conditions. Distinct paraphrenic states were to be seen not earlier than at 13 years. They differed from similar states of the adults by the fact that the fantastical delusions in the adolescent had a more rudimentary character, while as the sensorial and catatonic disorders were displayed much more massively. In an intermittent course of the disease the paraphrenic conditions were one of the phases in the development of the oniroid state, and the fantastical delusions developed in a close relationship with the special state of consciousness. The Attacks were of a transitory character. In an intermittent—progressive course of the disease with a slow development of the process the attacks were durative, with massively expressed affective, catatonic disorders, and fantastical delusions accompanying affective disorders. In cases of expressed progressiveness the attacks were of a frequent and protracted character, while as the fantastical delusions were related to phenomena of psychic automatisms.

//

REEL/FRA
19790673

2-22

USSR

UDC 636.22/28:576.8.097.29

BOLTUSHKIN, A. N., KOVAL'SKAYA, M. G., LUPANDINA, K. N., and STUPNIKOV, V. D.,
Leningrad Veterinary Institute; Leningrad Oblast' Veterinary Laboratory

"Fusariotoxicoses of Cattle"

Leningrad, Mikologiya i Fitopatologiya, Vol 5, No 1, 1971, pp 75-76

Abstract: For a number of years, fusariotoxicoses of cattle that developed as a result of consumption of straw, grain, and stubble infected with Fusarium fungi have been observed in the USSR. In 1967-69, fusariotoxicosis of cattle occurred at the Experimental Model Farm Kolozhitsy in Volosovsk Rayon, Leningrad Oblast', after the cattle had been driven to pasture on a harvested rye field. The symptoms and pathological-anatomical changes in the diseased cattle were identical with those observed in cattle upon experimental feeding of grain infected with Fusarium sporotrichiella. Symptomatic treatment was applied. F. graminearum and F. oxysporum were isolated from samples of straw stalks, ears, and rye grains collected from the field and used as feed by the cattle. The degree of infection of the feed with these fungi was 40-100%. The cultures of fungi that were isolated were considered toxic on the basis of lethality for Paramecia caudata and the effect on the

1/2

- 101 -

USSR

BOLTUSHKIN, A. N., et al., Mikologiya i Fitopatologiya, Vol 5, No 1, 1971,
pp 75-76

skin of rabbits of ether extracts of the fungi. Similar symptoms were
shown in 1962 by cattle on the farm in question, but the disease was not
identified then.

2/2

The author thanks R.S. Stepanov and V.G. Izrael for their valuable comments.

Reliability Theory

354

UDC 421.382.681.562

WISCONSIN, W.A., IOWA, S.D., OREGON, N.Y.

"Problem of Reliability of Semiconductor Thermoelectric Devices"

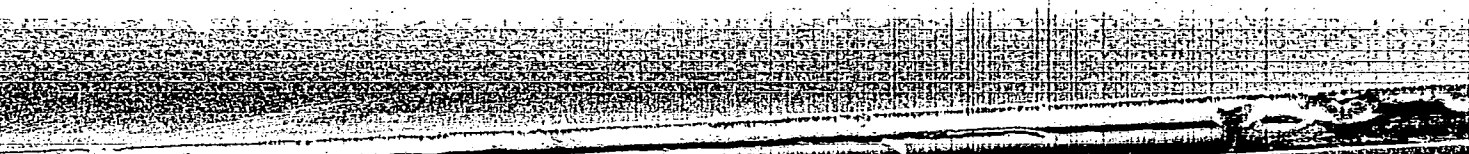
Applodil'in, lepton, i tekhnol. Rys. seriyed. mashina-ischa. no. 1 (Center Technica And Technology. Republika Interdepartmental Scientific Technical Collection), 1970, No 9, pp 1-5 (From Radi-Electronics i yeye prikladnyye. No 11, November 1970, Assistant No 11172).

Transistors: Various types of semiconductor devices are considered and their qualitative reliability indices are presented. The area of applicability of the exponential law of the probability density distribution of lifetimes is described for calculations on the devices mentioned. On the basis of an analysis of the quantitative reliability indices, and the design and technological features of the devices, a series of recommendations are given with respect to an increase of

of them are considered with the object of demonstrating the causes for their occurrence. 4 ref. Summary.

"APPROVED FOR RELEASE: 09/19/2001

CIA-RDP86-00513R002201830002-3



APPROVED FOR RELEASE: 09/19/2001

CIA-RDP86-00513R002201830002-3"

UDC: 669.293.5:621.785(088.8)

USSR

PROKOSHKIN, D. A., VASIL'YEVA, Ye. V., TRET'YAKOV, V. I., LUPAKOV, I. S.

"Method of Heat Treatment of Niobium and its Alloys"

USSR Author's Certificate Number 352882, Filed 18/06/71, Published 27/02/73
(Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No 81871).

Translation: This method, including annealing, differs in that in order to increase the elastic properties before annealing cold plastic deformation is conducted with compression greater than 50%, and annealing is performed at 500-900°. Unalloyed Nb, treated by this method, has an elastic limit of 56 kg/mm².

1/1

- 20 -

UDC 621.785.661.65

USSR

KUZ'MICHEV, Yu. S., LUPAKOV, I. S., BOROK, B. A., and GAVILLOVA, V. K.,
Central Scientific Research Institute of Ferrous Metallurgy imeni I. P.
Bardin

"Investigation of the Effect of Boron on the Thermal Conductivity and Thermal
Expansion of Titanium"

Kiev, Poroshkovaya Metallurgiya, No 8, Aug 70, pp 78-82

Abstract: Results are presented of an investigation of the effect of boron on thermal conductivity and linear expansion of titanium. The investigation was carried out by the comparative method using samples containing 1, 2, 3, and 4 wt. % boron. Boron increased the thermal conductivity of titanium. The thermal conductivity of titanium with boron, derived experimentally was somewhat higher than the rated one based on the heterogeneity of the alloy and if it is considered that the alloy consists of a solid boron solution in titanium and titanium diborides. The coefficient of linear expansion of titanium decreased appreciably with the introduction of boron into it.

1/1

- 71 -

USSR

UDC 621.039.553.36:620.193.47.4

GERASIMOV, V. V., GROMOVA, A. I., ~~INRAKOV~~ I. S., MCHROZOVA, I. K.,
BAKULEVSKIY, A. A., BELOUS, V. N., and KOLESOV, B. I.

"Corrosion and Electrochemical Behavior of Carbon Steels Under Quasi-reactor Conditions"

Moscow, Atomnaya Energiya, Vol 28, No 1, Jan 70, pp 13-18

Abstract: The article describes results of a study of the corrosion and electrochemical behavior of steels of the perlitic class in water at 300°C at various oxygen concentrations (0.02-40 and 1000 mg/kg) at pH = 7-10, as well as a study of the effect of reactor irradiation on the corrosion processes of perlitic steels. The corrosion and electrochemical tests were staged under static and dynamic conditions. The perlitic steels studied included St. 20 (C 0.17%; Cr 0.25%; Ni 0.25%; Mn 0.35%; Si 0.17%); 12KhM (C 0.12%; Cr 0.94%; Mn 0.59%; Si 0.3%; Mo 0.4%); and 16GNM (C 0.18%; Ni 1.41%; Mn 1.18%; Si 0.23%; Mo 0.26%). Specimens of stainless steel Kh18N10T (C 0.08%; Cr 17-19%; Ni 9-11%; Mn 1.2%; Si 0.8%; Ti 0.6%) were comparison-tested.

1/2

USSR

GERASIMOV, V. V., et al., Atomnaya Energiya, Vol 28, No 1, Jan 70, pp 13-18

It was found that in demineralized water at 300° C an increase in the oxygen concentration from 0.02 to 40 mg/l increases the corrosion rate of perlitic steels, with pitting corrosion developing with a pit depth of up to 0.1 mm. In oxygen-containing water under static conditions a complex dependence of anodic process rate on potential is observed in steels of the perlitic class. In demineralized de-aerated water an increase in the pH to 10 (by introducing ammonia) results in a decrease in the corrosion rate, with no development of pitting corrosion being observed. Irradiation reduces the corrosion resistance of the steels during the initial testing period. The corrosion rate under irradiation decreases with an increase in exposure time, and after 3500 hours of tests the corrosion rate for the perlitic steels is practically the same with or without irradiation.

2/2

Acc. Nr:

AF0042127

Abstracting Service:

NUCLEAR SCI. ABST. 4-70

Ref. Code:

UR0089

12371 CORROSION AND ELECTROCHEMICAL BEHAVIOR
OF CARBON STEELS UNDER CONDITIONS SIMILAR TO THOSE
IN REACTOR OPERATION. Gerasimov, V. Y.; Gromova, A. I.;
Lupakov, I. S.; Morozova, I. K.; Bakulevskii, A. A.; Belous, V. N.;
Kolesov, B. I. At. Energ. (USSR): 28: 13-18 (Jan 1970). (In
Russian).

The corrosion and electrochemical behavior of carbon steels
was studied in water at 300°C with oxygen concentrations equal
to 0.02 to 40 and 1000 ppm. The samples of carbon steels, ir-
radiated in the reactor and non-irradiated samples were tested
under static and dynamic conditions. The increase of oxygen
concentration in water intensified corrosion of carbon steels.
Irradiation reduced steel corrosion resistance during the initial
test period. (auth)

pc

REEL/FRAME
19760028

18

UNCLASSIFIED
TITLE--THE CLINICO PSYCHOPATHOLOGICAL FEATURES OF ATTACKLIKE SCHIZOPHRENIA
IN CHILDREN AND ADOLESCENTS, REPORT 1. PERIODICAL FORM -U-
AUTHOR--LUPANDIN, V.M.
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA, 1970,
VOL 70, NR 3, PP 425-430
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--SCHIZOPHRENIA, PEDIATRICS
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1982/0804
CIRC ACCESSION NO--APC052240
STEP NO--UR/0246/70/070/003/0425/0430
UNCLASSIFIED

2/2

022

CIRC ACCESSION NO--AP0052240
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--18 SEP 80

ABSTRACT. THE AUTHOR REPORTS OF A FOLLOW UP STUDY OF PERIODICAL FORMS OF SCHIZOPHRENIA IN CHILDREN AND ADOLESCENTS (54 CASES). IN PERIODICAL SCHIZOPHRENIA OF CHILDHOOD (8 TO 9 YEARS) THE ENCOUNTERED ATTACKS ARE SIMILAR TO THOSE SEEN IN ADULTS. HOWEVER THEY ARE MORE ELEMENTARY IN THE PSYCHOPATHOLOGICAL STRUCTURE, THERE ARE NO DELUSIONS OF SIGNIFICANCE SO FREQUENTLY SEEN IN ADULTS, NO FANTASTICAL DELUSIONS OF PHENOMENA OF PSYCHIC AUTOMATISMS. THE ATTACKS ARE CHARACTERIZED BY MORE EXPRESSED MOTOR AND SENSORIAL DISTURBANCES. THE ATTACKS PROPER ARE SHORTER THAN IN ADULT PATIENTS. ATTACKS OF PERIODICAL SCHIZOPHRENIA IN ADOLESCENCY (BEGINNING FROM 13 YEARS OF AGE) MORE RESEMBLE THOSE OF THE ADULTS, WITH THE EXCEPTION THAT DELUSIONAL STATES HAVE MORE FREQUENTLY A REDUCED CHARACTER WHILE AS MOTOR AND SENSORIAL DISORDERS, AS WELL AS DISORDERS RELATED TO REFLEXIA ARE EXPRESSED MUCH MORE GROSSLY.

Acc. Nr: **AP0047178**

Ref. Code: UR 0246

PRIMARY SOURCE: Zhurnal Nevropatologii i Psikhatrii, 1970,
Vol 70, Nr 2, pp 256-261

PARAPHRENIC STATES IN REMITTENT SCHIZOPHRENIA
OF ADOLESCENCY

V. M. Lupandin and St. Stoyanov

Among the 200 patients with recurrent forms of schizophrenia and an onset at 8—16 years, there were 50 cases where the disease was manifested by attacks with paraphrenic conditions. Distinct paraphrenic states were to be seen not earlier than at 13 years. They differed from similar states of the adults by the fact that the fantastical delusions in the adolescent had a more rudimentary character, while as the sensorial and catatonic disorders were displayed much more massively. In an intermittent course of the disease the paraphrenic conditions were one of the phases in the development of the oneiroid state, and the fantastical delusions developed in a close relationship with the special state of consciousness. The Attacks were of a transitory character. In an intermittent—progressive course of the disease with a slow development of the process the attacks were durative, with massively expressed affective, catatonic disorders, and fantastical delusions accompanying affective disorders. In cases of expressed progressiveness the attacks were of a frequent and protracted character, while as the fantastical delusions were related to phenomena of psychic automatisms.

REEL/FRAME
19790673

UDC 636.22/28:576.8.097.29

USSR

BOLTUSHKIN, A. N., KOVAL'SKAYA, M. G., LUPANDINA, K. N., and STUPNIKOV, V. D.,
Leningrad Veterinary Institute; Leningrad Oblast' Veterinary Laboratory

"Fusariotoxicoses of Cattle"

Leningrad, Mikologiya i Fitopatologiya, Vol 5, No 1, 1971, pp 75-76

Abstract: For a number of years, fusariotoxicoses of cattle that developed as a result of consumption of straw, grain, and stubble infected with Fusarium fungi have been observed in the USSR. In 1967-69, fusariotoxicosis of cattle occurred at the Experimental Model Farm Kolozhitsy in Volosovsk Rayon, Leningrad Oblast', after the cattle had been driven to pasture on a harvested rye field. The symptoms and pathological-anatomical changes in the diseased cattle were identical with those observed in cattle upon experimental feeding of grain infected with Fusarium sporotrichiella. Symptomatic treatment was applied. F. graminearum and F. oxysporum were isolated from samples of straw stalks, ears, and rye grains collected from the field and used as feed by the cattle. The degree of infection of the feed with these fungi was 40-100%. The cultures of fungi that were isolated were considered on the basis of lethality for *Paramecia caudata* and the effect on the

USSR

BOLTUSHKIN, A. N., et al., Mikologiya i Fitopatologiya, Vol 5, No 1, 1971,
pp 75-76

skin of rabbits of ether extracts of the fungi. Similar symptoms were
shown in 1962 by cattle on the farm in question, but the disease was not
identified then.

2/2

Reliability Theory

USSR

UDC 621.382.621.362

YEFIMOV, V.A., LUFANOV, B.S., SHATALOVA, N.F.

"Problem Of Reliability Of Semiconductor Thermoelectric Devices"

Kholodil'n. tekhn. i tekhnol. Resp. mezhved. nauchno-tekhn. sb. (Cooler Technics And Technology. Republic Interdepartmental Scientific-Technical Collection), 1970, No 9, pp 3-5 (from RZh--Elektronika i yeye primeneniye, No 11, November 1970, Abstract No 11B175)

Translation: Various types of thermoelectric devices are considered and their qualitative reliability indices are presented. The area of applicability of the exponential law of the probability density distribution of rejections is described for computations on the devices mentioned. On the basis of an analysis of the quantitative reliability indices, and the design and technological features of the devices, a series of recommendations are given with respect to an increase of the reliability and quality of the devices in question. Rejections are considered which took place during tests and exploitation of the devices, and the most common of them are considered with the object of demonstrating the causes for their occurrence. 4 ref. Summary.

1/1

UDC 538.574

USSR

LUPANOV, G.A. [Gor'kiy State University]

"Concerning One Problem Of Electromagnetic Wave Propagation In A Moving Plane-Stratified Medium"

Izv.VUZ:Radiofizika, Vol CV, No 8, Aug 1972, pp 1139-1146

Abstract: The paper considers the propagation of electromagnetic waves in a plane-stratified nonuniformly moving medium in a plane transverse to the motion. In a previous work of which Lupanov is a coauthor, in the case of "cold" plasma in a weakly-relativistic approximation ($v^2/c^2 \ll 1$) and with a condition of constancy of the electron concentration (in the locally accompanying frames of reference), the possibility was established of describing an electromagnetic field (during propagation in a plane transverse to the motion) by the superpositions of waves with left and right rotating field vectors. The results of this previous work are generalized in the present paper to the case of non-dispersive media and an arbitrary magnitude of the velocity. A precise solution is found which describes the reflection and transmission of waves through a layer with a velocity profile of the type $Ch^{-1}(z/D)$. Also studied is the effect of a nonzero velocity gradient on reflection from a layer linear with respect to ϵ . The author thanks N.S. Stepanov and V.G. Gavrilenco for discussion of the work and valuable comments. 9 ref. Received by editors, 5 Nov 1971.

UDC 533.9.01

USSR

GAVRILENKO, V.G., MIRANOV, G.A., STEPANOV, N.S. [Gorkiy State University]

"Dynamo-Optical Effects In A Plasma"

Izv. VUZ: Radiofizika, Vol XV, No 2, Feb 1972, pp 183-190

Abstract: The propagation is considered of electromagnetic waves in an inhomogeneous moving cold electron plasma without an external magnetic field and collisions. Movement is assumed to be steady. Part one and two of the paper -- "Tensor Of Dielectric Constant Of A Nonuniformly Moving Plasma" and "Propagation Of Waves In Slightly Inhomogeneous Medium -- consider waves in an isotropic plasma with parameters slowly variable in space, when it is possible to employ the approximations of geometrical optics. It is shown that in the case of a smooth change of the medium parameters, the beam trajectories are determined by the density distribution and the motion leads to rotation of the wave polarization plane. In part three -- "Passage Of Waves Through A Layer With A Constant Velocity Gradient" -- an example is presented of an exact solution of the problem for a layer with an arbitrarily rapid change of velocity; in this case, not only a rotation of the polarization plane of the propagating wave takes place, but also a change of the character of the polarization with reflection and refraction in the layer. 10 ref. Received by editors, 16 Apr 1971.

1/1

UDC 533.9.01

USSR

GAVRILENKO, V. G., LUPANOV, G. A., STEPANOV, N. S.,

"Dynamo-Optical Effects in a Plasma"

Gor'kiy, Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, Vol XV, No 2, 1972, pp 183-190

Abstract: A study was made of the propagation of electromagnetic waves in a nonuniformly moving cold electron plasma without an external magnetic field and collisions. The motion is assumed stationary. In the case of smooth variation of the parameters of the medium, the beam trajectories in the zero approximation of geometric optics are determined by the concentration distribution, and the motion leads to rotation of the polarization plane in the wave. For laminar flow with a constant velocity gradient, an exact solution of the equations was obtained which is a superposition of two independent waves elliptically polarized in opposite directions. The law of refraction of these waves was found, and the corresponding coefficients of reflection and penetration were calculated in the case of a layer of finite thickness. Formulas are found for the tensor of the dielectric constant of a nonuniformly moving plasma, wave propagation in a weakly inhomogeneous medium, and passage of waves through a layer with a constant velocity gradient.

1/1

USSR

UDC: 538.56:533.9.02

KOVNER, M. S., LAPIDUS, V. A., and LUPANOV, G. A.

"Radiation of Electric and Magnetic Dipoles in the Hollow Formed by a Plasma Layer"

Gor'kiy, Izvestiya VUZ--Radiofizika, Vol. 14, No. 1, 1971, pp 28-35

Abstract: The radiation of an electric and a magnetic dipole at the center of a dielectric sphere of given radius and a given dielectric constant surrounded by a spherical plasma layer having a dielectric constant of some other value is considered. The purpose of this analysis is to determine the characteristics of the dipoles, examining first the electric dipole and then the magnetic dipole. For the first of these, the authors begin with the wave equations for the vector potential A , obtaining equations for the electric and magnetic fields in terms of it. Because the expressions obtained for the antenna radiation resistance in three different regions of the space surrounding the antenna are too awkward, the authors resort to quasi-static and wave approximations. The magnetic dipole is similarly treated, beginning with E and H

1/2

USSR

KOVNER, M. S., Izvestiya VUZ--Radiofizika, Vol 14, No 1, 1971, pp 28-35

equations in terms of a magnetic potential. The radiation spectrum is plotted, and it is found that the field cannot penetrate the plasma layer at frequencies approaching zero. The authors express their gratitude to A. A. Andronov and Yu. V. Chugunov for their comments.

2/2

6

USSR

UDC: 519.1

LUPANOV, O. B.

"On Synthesizing Circuits From Threshold Elements"

Moscow, Probl. kibernetiki--sbornik (Problems of Cybernetics--collection of works), vyp. 26, "Nauka", 1973, pp 109-140 (from RZh-Matematika, No 9, Sep 73, abstract No 9V448 by V. Khrapchenko)

Translation: The paper is a detailed exposition of a note by the author (RZhMat, 1972, 8V458) and is devoted chiefly to establishing asymptotic formulas for $L(n)$ and $L(n,m)$ (RZhMat, 1972, 8V458). It is shown how on the basis of E. I. Nechiporuk's lower bound for $L(n)$ (RZhMat, 1964, 7V281 and 1965, 2V330) it is possible to explain the basic peculiarities of threshold element circuits for which the upper bound asymptotically coincides with the lower. With regard to these peculiarities, the author constructs first a "fairly good" and then the "asymptotically best" threshold element circuit. It is noted that the result, combined with the principle of local coding, enables construction of the asymptotically "best" threshold element circuits for classes of functions which allow simpler circuit realization than most functions. This position is il-

1/2

- 74 -

USSR

LUPANOV, O. B., Prikl. kibernetiki, vyp. 26, "Nauka", 1973, pp 109-140
 illustrated by two examples. Let $L(\mathcal{B}^n)(l_{M,n})$ be the least number of threshold
 elements sufficient for realizing any symmetric Boolean function (partial
 Boolean function defined on M sets of n variables). Then $L(\mathcal{B}^n) \sim 2 \left(\frac{n}{\log_2 n} \right)^{1/2}$.
 $L_{M, n_1} \sim 2 \left(\frac{M_1}{\log_2 M_1} \right)^{1/2}$ under the condition that $M_1 \rightarrow \infty$.

GLORIA

50. JPRS 55934
09 APR 1992

CONCERNING DISASTERS OF THRESHOLD ELEMENTS

CONCERNING DISCLOSE OF INFORMATION
 Institute of Applied Mathematics,
 Institute of Mathematics, Academy of Sciences, USSR,
 USSR Academy of Sciences, signed to President of USSR, 138-
 Moscow, Vol 202, No 6, 1972.
 12915

The algebraic function of the sets $\{x_1, \dots, x_n\}$ is termed threshold if there exists the test numbers $y_1, \dots, y_n$ such that $f(x_1, \dots, x_n) = 1$ then and only then when

$$251 + \dots + 252 \cdot 2^n$$

We know that for any threshold function we can select the integers $x_1, \dots, x_n, h$ in inequality (1) which determine it. The functional element (see, for example, [1]), which applies the threshold function, is termed a threshold element. The diagram of the threshold element is the diagram of a functional element, all elements of which apply the threshold function. We usually examine two definitions of the number of elements in a diagram of threshold elements: $L(f)$ -- the number of elements of the diagram (under the condition that the threshold element is given by the integral inequality (1)); $L(f/R)$ -- the sum of the number of elements in all elements of the diagram of functions (vector-function); let f be a function of a system of functions (vector-function); f be a function of $L(f)$ ($L(f/R)$) the minimal number of elements in the diagram of the threshold elements of threshold elements which we denote by $L(f)$ ($L(f/R)$) the number of elements in the diagram of the diagram of threshold elements for f in order to obtain a diagram for f . If B is a (finite) set $L(f)$ ($L(f/R)$) must be added to the results of the diagram for f in order to obtain a diagram for f . If B is a (finite) set $L(f)$ ($L(f/R)$) must be added to the results of the diagram for f in order to obtain a diagram for f . If B is a set of all functions of $x_1, \dots, x_n$ of n functions then by $L(B)$ ($L(B/R)$) we shall denote $\max_{f \in B} L(f)$ ($L(f/R)$). If B is a set of all functions of $x_1, \dots, x_n$ of n arguments (all systems $(f_1(x_1, \dots, x_n), \dots, f_m(x_1, \dots, x_n))$), which

USSR

LUPANOV, O. B.

"Asymptotic Estimates of the Complexity of Control Systems"

Mezhdunar. Kongress Matematikov v Nitstse. 1970 [International Congress of Mathematicians in Nitstse, 1970 -- Collection of Works], Moscow, Nauka Press, 1972, pp 162-167 (Translated from Referativnyy Zhurnal, Kibernetika, No 3, Moscow, 1973, Abstract No 3 V421).

Translation: A review of certain results of Soviet authors in the area of the asymptotic theory of synthesis of control systems, produced in recent years.

1/1

USSR

UDC 51 621.391

LUPANOV, O. B.

"Circuits of Functional Elements with Delays"

Probl. Kibernetiki [Problems of Cybernetics -- Collection of Works], No. 23, Moscow, Nauka Press, 1970, pp 43-81 (Translated from Referativnyy Zhurnal Kibernetika, No. 4, April, 1971, Abstract No. 4 V470 by G. Blokhina).

Translation: It is noted that with traditional methods of realization of logic algebra functions (laf) (contact circuits, Π circuits, circuits of functional elements, formulas), the so-called Shannon effect occurs: "almost all functions" of n arguments have "almost identical" complexity, asymptotically equal to the complexity of the most complex function of n arguments. The hypothesis of this effect was stated by Shannon in 1949 (Shannon, C. E., Bell Syst. Techn. J., 1949, 28, No. 1, 59-98) and later proven by the author of the present article (RZhMat, 1961, 2A176). In certain cases (for example for disjunctive normal forms), the "weak Shannon effect" occurs, "almost all functions of n arguments have almost identical complexity," although it is less than the complexity of the most complex function (RZhMat, 1968, 7V307). This article studies one natural class of control system -- right systems of functional elements with delays, for which these effects generally do not obtain.

1/5

- 26 -

USSR

UDC 51.621.391

LUPANOV, O. B., Probl. Kibernetiki, No. 23, Moscow, Nauka Press, 1970, pp 43-81.

Circuits of the following elements are studied. Each element E_i corresponds to a certain law $\phi_i(x_1, \dots, x_{k_i})$ and two positive numbers: p_i -- the "weight of the element" and T_i -- the "delay of the element"; these numbers are not assumed to be integers. If $k_i > 2$, the numbers p_i and T_i are called the reduced

$$\frac{p_i}{k_i-1} \quad \frac{T_i}{\log_2 k_i}$$

weight and reduced delay of element E_i respectively. It is assumed that the number of inputs of element E_i where $k_i \geq 1$ is k_i , while $k_i = 0$ (i. e., if the element produces a constant) it is equal to 1. The circuits are constructed in the finite set $S = \{E_1, \dots, E_r\}$ elements of this type in correspondence with the rules for construction of circuits of functional elements. The connection between element $E(1)$ and $E(2)$ of the circuit refers to the sequence of elements of the circuit $E_{i_1}, \dots, E_{i_s}$ with the following properties: 1) A certain input of element E_{i_j} is connected to the output of element $E_{i_{j-1}}$ ($2 \leq j \leq s$); 2) $E(1) = E_{i_1}$, $E(2) = E_{i_s}$.

The number $T_{i_1} + \dots + T_{i_s}$ is called the delay of the circuit. The circuit is called primary if one input of its first element E_{i_1} is the input of the entire circuit, while the output of its last element E_{i_s} is the output of the entire circuit. Circuit S is called right if the delays of all of its main circuits are equal.

2/5

USSR

UDC 51.621.391

LUPANOV, O. B., Probl. Kibernetiki, No. 23, Moscow, Nauka Press, 1970, pp 43-81.

Let Φ be the set of all base laf $\phi_i(x_1, \dots, x_{k_i})$, depending significantly on at least two arguments, and Φ^* be its subset consisting of all ϕ -functions. Suppose

$$\rho = \min_{\phi_i \in \Phi} \frac{p_i}{k_i - 1}, \quad \tau = \min_{\phi_i \in \Phi} \frac{T_i}{\log_2 k_i}, \quad \rho^* = \min_{\phi_i \in \Phi^*} \frac{p_i}{k_i - 1},$$

$$\tau^* = \min_{\phi_i \in \Phi^*} \frac{T_i}{\log_2 k_i}.$$

The statements are proven.

Theorem 1. If base is regular, then

- 1) $L(n) \sim L^C(n) \sim L^\Phi(n) \sim p \frac{2^n}{n}$;
- 2) $T(n) \sim T^C(n) \sim T^\Phi(n) \sim \tau n$;

3) Furthermore, for any $\epsilon > 0$ and any laf $f(x_1, \dots, x_n)$ of a sufficiently large number of arguments there is a circuit S realizing f , such that

$$L(S) < (1 + \epsilon) \rho \frac{2^n}{n}, \quad T(S) < (1 + \epsilon) \tau n.$$

4/5

USSR

UDC 51.621.391

LUPANOV, O. B., Probl. Kibernetiki, No. 23, Moscow, Nauka Press, 1970, pp 43-81.

This general number is called the delay of the circuit and is represented as $T(S)$. The function realized by the circuit and complexity $L(S)$ of the circuit are determined as for circuits of functional elements. It is assumed that $\mathcal{E}$ of initial elements is complete in the sense that for each laf f , a right circuit can be constructed realizing f (with a certain delay). The total base is called regular if the circuits in the base can realize all four functions of one argument x , $\bar{x}$, 0 and 1 with identical delay. Otherwise the base is called irregular. The laf $f(x_1, \dots, x_n)$ is called a ϕ -function if $f(x, x, \dots, x) \neq \text{const}$, otherwise it is called a c-function. Shannon functions are studied: $L(f)$ -- the minimum of complexities of (right) circuits realizing laf f ; $T(f)$ -- the minimum delays of circuits realizing laf f . That $N_n(N_n^c, N_n^\phi)$ respectively be the set all laf (of all c-functions, ϕ -functions respectively) $f(x_1, \dots, x_n)$ and suppose

$$\begin{aligned} L(n) &= \max_{f \in N_n} L(f), \quad T(n) = \max_{f \in N_n} T(f); \\ L^c(n) &= \max_{f \in N_n^c} L(f), \quad T^c(n) = \max_{f \in N_n^c} T(f); \quad L^\phi(n) = \max_{f \in N_n^\phi} L(f), \\ T^\phi(n) &= \max_{f \in N_n^\phi} T(f). \end{aligned}$$

3/5

- 27 -

USSR

UDC 51.621.391

LUPANOV, O. B., Probl. Kibernetiki, No. 23, Moscow, Nauka Press, 1970, pp 43-81.

Theorem 2. If base is irregular, then

$$1a) L^c(n) \sim p \frac{2^n}{n};$$

$$1b) L(n) \sim L^\phi(n) \sim p^* \frac{2^n}{n};$$

$$2a) T^c(n) \sim \tau n;$$

$$2b) T(n) \sim T^\phi(n) \sim \tau^* n;$$

3) Furthermore, for any $\epsilon > 0$ and any c-function (ϕ -function) $f(x_1, \dots, x_n)$ of a sufficiently large number of arguments there is a circuit S realizing f and such that

$$L(S) < (1 + \epsilon) p \frac{2^n}{n}, T(S) < (1 + \epsilon) \tau n$$

(respectively

$$\forall (1 + \epsilon) p^* \frac{2^n}{n}, T(S) < (1 + \epsilon) \tau^* n).$$

5/5

2

USSR

UDC 621.3.049.63

PETROV, E. M., KHRYCHEV, L. I., FILIPPOV, V. Ye., LUPANOV, V. Ye., ZABORSKIY, V. N., ISAYEV, V. S.

"A Device for Attaching Wire Leads to the Contact Areas of Integrated Circuits"

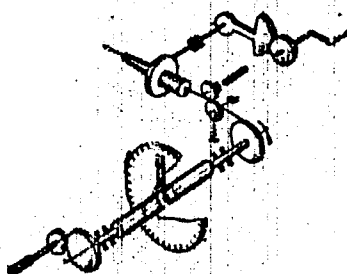
Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 7, Mar 71, Author's Certificate No 295217, Division H, filed 21 Apr 69, published 4 Feb 71, p 172

Translation: This Author's Certificate introduces a device for attaching wire leads to the contact areas of integrated circuits. The device contains a drum on which a wire is wound, drive rolls, a guide capillary and a unit for checking the strength of the joint between the leads and the contact areas. As a distinguishing feature of the patent, the precision of measuring this joint strength is improved by fastening the drum on one end of a torsion spring carrying an angle-of-turn indicator, the other end of this spring being connected to the drive mechanism.

1/2

USSR

PETROV, E. M., et al., Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 7, Mar 71, Author's Certificate No 295217, Division H, filed 21 Apr 69, published 4 Feb 71, p 172

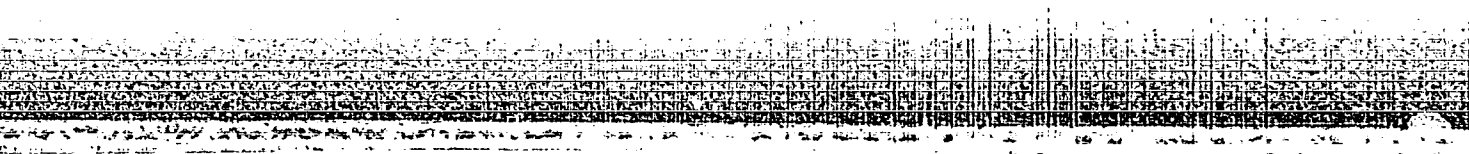


2/2

- 54 -

"APPROVED FOR RELEASE: 09/19/2001

CIA-RDP86-00513R002201830002-3



APPROVED FOR RELEASE: 09/19/2001

CIA-RDP86-00513R002201830002-3"

USSR

GAVRILENKO, V. G., LUPANOV, G. A., STEPANOV, N. S.,

UDC 533.9.01

"Dynamo-Optical Effects in a Plasma"

Gor'kiy, Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, Vol XV, No 2, 1972, pp 183-190

Abstract: A study was made of the propagation of electromagnetic waves in a nonuniformly moving cold electron plasma without an external magnetic field and collisions. The motion is assumed stationary. In the case of smooth variation of the parameters of the medium, the beam trajectories in the zero approximation of geometric optics are determined by the concentration distribution, and the motion leads to rotation of the polarization plane in the wave. For laminar flow with a constant velocity gradient, an exact solution of the equations was obtained which is a superposition of two independent waves elliptically polarized in opposite directions. The law of refraction of these waves was found, and the corresponding coefficients of reflection and penetration were calculated in the case of a layer of finite thickness. Formulas are found for the tensor of the dielectric constant of a nonuniformly moving plasma, wave propagation in a weakly inhomogeneous medium, and passage of waves through a layer with a constant velocity gradient.

1/1

USSR

APPROVED FOR RELEASE: 09/19/2001

CIA-RDP86-00513R002201830002-3"

GAVRILENKO, V.G., LUPANOV, G.A., STEPANOV, N.S. [Gorkiy State University]

"Dynamo-Optical Effects In A Plasma"

Izv. VUZ: Radiofizika, Vol XV, No 2, Feb 1972, pp 183-190

Abstract: The propagation is considered of electromagnetic waves in an inhomogeneous moving cold electron plasma without an external magnetic field and collisions. Movement is assumed to be steady. Parts one and two of the paper consider waves in a medium with parameters slowly variable in space, when it is possible to employ the approximations of geometrical optics. It is shown that in the case of a smooth change of the medium parameters, the beam trajectories are determined by the density distribution and the motion leads to rotation of the wave polarization plane. In part three, "Passage Of Waves Through A Layer With A Constant Velocity Gradient" -- an example is presented of an exact solution of the problem for a layer with an arbitrarily rapid change of velocity; in this case, not only a rotation of the polarization plane of the propagating wave takes place, but also a change of the character of the polarization with reflection and refraction in the layer. 10 ref. Received by editors, 16 Apr 1971.

1/1

USSR

USSR

KOVNER, M. S., Izvestiya VUZ--Radiofizika, Vol 14, No 1, 1971, pp 28-35

equations in terms of a magnetic potential. The radiation spectrum is plotted, and it is found that the field cannot penetrate the plasma layer at frequencies approaching zero. The authors express their gratitude to A. A. Andronov and Yu. V. Chugunov for their comments.

2/2

- 6 -

USSR

LUPANOV, O. B.

UDC: 519.1

"On Synthesizing Circuits From Threshold Elements"

Moscow, Probl. kibernetiki--sbornik (Problems of Cybernetics--collection of works), vyp. 26, "Nauka", 1973, pp 109-140 (from RZh-Matematika, No 9, Sep 73, abstract No 9V448 by V. Khrapchenko)

Translation: The paper is a detailed exposition of a note by the author (RZhMat, 1972, 8V458) and is devoted chiefly to establishing asymptotic formulas for $L(n)$ and $L(n,m)$ (RZhMat, 1972, 8V458). It is shown how on the basis of E. I. Nechiporuk's lower bound for $L(n)$ (RZhMat, 1964, 7V281 and 1965, 2V330) it is possible to explain the basic peculiarities of threshold element circuits for which the upper bound asymptotically coincides with the lower. With regard to these peculiarities, the author constructs first a "fairly good" and then the "asymptotically best" threshold element circuit. It is noted that the result, combined with the principle of local coding, enables construction of the asymptotically "best" threshold element circuits for classes of functions which allow simpler circuit realization than most functions. This position is il-

1/2

- 74 -

USSR

LUPANOV, O. B., Prikl. kibernetiki, vyp. 26, "Nauka", 1973, pp 109-140

illustrated by two examples. Let $L(\mathcal{B})(L_{M,n})$ be the least number of threshold elements sufficient for realizing any symmetric Boolean function (partial

Boolean function defined on M sets of n variables). Then $L(\mathcal{B}) \sim 2 \left(\frac{n}{\log_2 n} \right)^{1/2}$.

$L_{M,n} \sim 2 \left(\frac{M}{\log_2 M} \right)^{1/2}$ under the condition that $M \rightarrow \infty$.

LUPANOV, O.B.

GLORIA

50. JPRS 55934
09 MAY 1972

CONCERNING DIAGRAMS OF THRESHOLD ELEMENTS

1972 511:53

[Article by O.B. Lupanov, Institute of Applied Mathematics,
USSR Academy of Sciences, Moscow, U.S.S.R. and Leningrad, U.S.S.R., Pub-
lished Vol 202, No 5, 1972. Signed to Press 3 June 1971. Pp 206-
221]

The algebraic function of the type $f(x_1, \dots, x_n)$ is
termed threshold if there exist the real numbers $w_1, \dots, w_n, b$
such that $f(x_1, \dots, x_n) = 1$ then and only then when

$$w_1x_1 + \dots + w_nx_n \geq b.$$

(1)

We know that for any threshold function we can select the in-
tegers $w_1, \dots, w_n, b$ in inequality (1) which determine it.
The functional element (see, for example, [1]), which applies
the threshold function, is termed a threshold element. The di-
agram of the threshold element is the diagram of functional
element, all elements of which apply the threshold functional
element. We usually examine two definitions of the threshold functional
element: LS -- the number of the complexity of the element,
 S , and $LS(S)$ -- the sum of the moduli of all coefficients in
all elements of the diagram (under the condition that the thresh-
old functions are given by the integral inequalities (1)). Let
 f be a function or system of functions (vector-function); let
us denote by $L(f)$ ($LS(f)$) the minimal number of elements in
the diagram of the threshold elements which apply f (minimal
number of elements in the diagram of threshold elements which
obtain a diagram for f). If f is a (finite) set (vector) of
functions then by $L(f)$ ($LS(f)$) we shall denote $\max L(f)$ ($\max LS(f)$).
If f is a set of all functions of $f(x_1, \dots, x_n)$ of n (with
arguments (all systems $(f_1(x_1, \dots, x_n), \dots, f_n(x_1, \dots, x_n))$), which

USSR

LUPANOV, O. B.

"Asymptotic Estimates of the Complexity of Control Systems"

Mezhdunar. Kongress Matematikov v Nitstse. 1970 [International Congress of Mathematicians in Nitstse, 1970 -- Collection of Works], Moscow, Nauka Press, 1972, pp 162-167 (Translated from Referativnyy Zhurnal, Kibernetika, No 3, Moscow, 1973, Abstract No 3 V421).

Translation: A review of certain results of Soviet authors in the area of the asymptotic theory of synthesis of control systems, produced in recent years.

1/1

USSR

UDC 51 621.391

LUPANOV, O. B.

"Circuits of Functional Elements with Delays"

Probl. Kibernetiki [Problems of Cybernetics -- Collection of Works], No. 23, Moscow, Nauka Press, 1970, pp 43-81 (Translated from Referativnyy Zhurnal Kibernetika, No. 4, April, 1971, Abstract No. 4 V470 by G. Blokhina).

Translation: It is noted that with traditional methods of realization of logic algebra functions (laf) (contact circuits, Π circuits, circuits of functional elements, formulas), the so-called Shannon effect occurs: "almost all functions" of n arguments have "almost identical" complexity, asymptotically equal to the complexity of the most complex function of n arguments. The hypothesis of this effect was stated by Shannon in 1949 (Shannon, C. E., Bell Syst. Techn. J., 1949, 28, No. 1, 59-98) and later proven by the author of the present article (RZhMat, 1961, 2A176). In certain cases (for example for disjunctive normal forms), the "weak Shannon effect" occurs, "almost all functions of n arguments have almost identical complexity," although it is less than the complexity of the most complex function (RZhMat, 1968, 7V307). This article studies one natural class of control system -- right systems of functional elements with delays, for which these effects generally do not obtain.

1/5

USSR

UDC 51.621.391

LUPANOV, O. B., Probl. Kibernetiki, No. 23, Moscow, Nauka Press, 1970, pp 43-81.

Circuits of the following elements are studied. Each element E_i corresponds to a certain law $\phi_i(x_1, \dots, x_{k_i})$ and two positive numbers: p_i -- the "weight of the element" and T_i -- the "delay of the element"; these numbers are not assumed to be integers. If $k_i \geq 2$, the numbers p_i and T_i are called the reduced

$$\frac{p_i}{k_i-1} \quad \frac{T_i}{\log_2 k_i}$$

weight and reduced delay of element E_i respectively. It is assumed that the number of inputs of element E_i where $k_i \geq 1$ is k_i , while $k_i = 0$ (i. e., if the element produces a constant) it is equal to 1. The circuits are constructed in the finite set $S = \{E_1, \dots, E_r\}$ elements of this type in correspondence with the rules for construction of circuits of functional elements. The connection between element $E(1)$ and $E(2)$ of the circuit refers to the sequence of elements of the circuit $E_{i_1}, \dots, E_{i_s}$ with the following properties: 1) A certain input of element E_{i_j} is connected to the output of element $E_{i_{j-1}}$ ($2 \leq j \leq s$); 2) $E(1) = E_{i_1}$, $E(2) = E_{i_s}$.

The number $T_{i_1} + \dots + T_{i_s}$ is called the delay of the circuit. The circuit is called primary if one input of its first element E_{i_1} is the input of the entire circuit, while the output of its last element E_{i_s} is the output of the entire circuit. Circuit S is called right if the delays of all of its main circuits are equal.

2/5

USSR

UDC 51.621.391

LUPANOV, O. B., Probl. Kibernetiki, No. 23, Moscow, Nauka Press, 1970, pp 43-81.

Let Φ be the set of all base functions $\phi_i(x_1, \dots, x_{k_i})$, depending significantly on at least two arguments, and Φ^* be its subset consisting of all ϕ -functions. Suppose

$$\rho = \min_{\phi_i \in \Phi} \frac{p_i}{k_i - 1}, \quad \tau = \min_{\phi_i \in \Phi} \frac{T_i}{\log_2 k_i}, \quad \rho^* = \min_{\phi_i \in \Phi^*} \frac{p_i}{k_i - 1},$$

$$\tau^* = \min_{\phi_i \in \Phi^*} \frac{T_i}{\log_2 k_i}.$$

The statements are proven.

Theorem 1. If base is regular, then

1) $L(n) \sim L^C(n) \sim L^\Phi(n) \sim \frac{2^n}{n};$

2) $T(n) \sim T^C(n) \sim T^\Phi(n) \sim \tau n;$

3) Furthermore, for any $\epsilon > 0$ and any function $f(x_1, \dots, x_n)$ of a sufficiently large number of arguments there is a circuit S realizing f , such that

$$L(S) < (1 + \epsilon) \rho \frac{2^n}{n}, \quad T(S) < (1 + \epsilon) \tau n.$$

4/5

USSR

UDC 51.621.391

LUPANOV, O. B., Probl. Kibernetiki, No. 23, Moscow, Nauka Press, 1970, pp 43-81.

This general number is called the delay of the circuit and is represented as $T(S)$. The function realized by the circuit and complexity $L(S)$ of the circuit are determined as for circuits of functional elements. It is assumed that $\mathcal{E}$ of initial elements is complete in the sense that for each laf f , a right circuit can be constructed realizing f (with a certain delay). The total base is called regular if the circuits in the base can realize all four functions of one argument $x, \bar{x}, 0$ and 1 with identical delay. Otherwise the base is called irregular. The laf $f(x_1, \dots, x_n)$ is called a ϕ -function if $f(x, x, \dots, x) \neq \text{const}$, otherwise it is called a c -function. Shannon functions are studied: $L(f)$ -- the minimum of complexities of (right) circuits realizing laf f ; $T(f)$ -- the minimum delays of circuits realizing laf f . That $N_n(N_n^c, N_n^\phi)$ respectively be the set all laf (of all c -functions, ϕ -functions respectively) $f(x_1, \dots, x_n)$ and suppose

$$\begin{aligned} L(n) &= \max_{f \in N_n} L(f), \quad T(n) = \max_{f \in N_n} T(f); \\ L^c(n) &= \max_{f \in N_n^c} L(f), \quad T^c(n) = \max_{f \in N_n^c} T(f); \quad L^\phi(n) = \max_{f \in N_n^\phi} L(f), \\ T^\phi(n) &= \max_{f \in N_n^\phi} T(f). \end{aligned}$$

3/5

USSR

UDC 51.621.391

LUPANOV, O. B., Probl. Kibernetiki, No. 23, Moscow, Nauka Press, 1970, pp 43-81.

Theorem 2. If base is irregular, then

1a) $L^c(n) \sim p \frac{2^n}{n}$;

1b) $L(n) \sim L^\phi(n) \sim p^* \frac{2^n}{n}$;

2a) $T^c(n) \sim \tau n$;

2b) $T(n) \sim T^\phi(n) \sim \tau^* n$;

3) Furthermore, for any $\epsilon > 0$ and any c-function (ϕ -function) $f(x_1, \dots, x_n)$ of a sufficiently large number of arguments there is a circuit S realizing f and such that

$$L(S) < (1+\epsilon) p \frac{2^n}{n}, T(S) < (1+\epsilon) \tau n$$

(respectively

$$\forall (1+\epsilon) p^* \frac{2^n}{n}, T(S) < (1+\epsilon) \tau^* n).$$

5/5

USSR

UDC 621.3.049.63

PETROV, E. M., KHRYSHEV, L. I., FILIPPOV, V. Ye., LUPANOV, V. Ye., ZABORSKIY, V. N., ISAYEV, V. S.

"A Device for Attaching Wire Leads to the Contact Areas of Integrated Circuits"

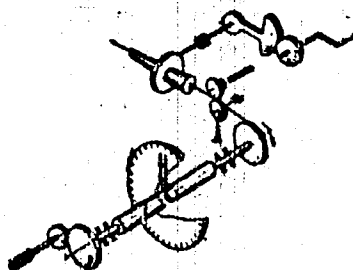
Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 7, Mar 71, Author's Certificate No 295217, Division H, filed 21 Apr 69, published 4 Feb 71, p 172

Translation: This Author's Certificate introduces a device for attaching wire leads to the contact areas of integrated circuits. The device contains a drum on which a wire is wound, drive rolls, a guide capillary and a unit for checking the strength of the joint between the leads and the contact areas. As a distinguishing feature of the patent, the precision of measuring this joint strength is improved by fastening the drum on one end of a torsion spring carrying an angle-of-turn indicator, the other end of this spring being connected to the drive mechanism.

1/2

USSR

PETROV, E. M., et al., Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 7, Mar 71, Author's Certificate No 295217, Division H, filed 21 Apr 69, published 4 Feb 71, p 172



2/2

- 54 -

USSR

UDC 51.621.391

LUPANOVA, R. I., ROMANKEVICH, A. M.

"Realization of k-Valued Functions by m-Valued Elements"

Vestn. Kiev. Politekhn. In-ta Ser. Avtomatiki i Elektronpriborostr [Herald of Kiev Polytechnical Institute. Automation and Electrical Instrument Building Series], No 8, 1971, pp 39-41, (Translated from Referativnyy Zhurnal, Kibernetika, No 10, 1971, Abstract No 10 V629).

NO ABSTRACT.

USSR

LUPEYKIS, Z. Yu, Vil'nyus State Educational Institute

"On the Geometry of Systems of First-Order Partial Differential Equations"

Vil'nyus, Litovskiy Matematicheskii Sbornik, Vol 13, No 3, 1973, pp 119 - 139

Abstract: The study of systems of partial differential equations with respect to known nondegenerate transformations can be reduced to the study of a certain subspace of the corresponding space, the local coordinates of which are functions, independent variables, and all partial derivatives up to the order of the space, with respect to the same transformations. The study of this space is what is meant by the geometry of a system of differential equations. This work is devoted to finding objects of varying dimensionality corresponding to the "model" spaces and to establishing the order of their coverage by a given fundamental differential-geometric object.

The article is in two sections, the first devoted to systems with partial derivatives with respect to $x^i = x^i(x^1)$ and $u^\alpha = u^\alpha(u^\alpha)$, the second to those with respect to $x^i = x^i(x^1, u^\alpha)$, $u^\alpha = u^\alpha(x^1, u^\alpha)$. G. F. Laptev's method is used. Beginning with results previously obtained by V. I. Bliznikas, the first section contains a proof that it is always possible to obtain an affine connectivity if a linear differential-geometric connectivity exists, and vice-versa. Two special cases are then considered in detail.

1/2

Lithuanian SSR

LUPEYKIS, Z. Yu, Vil'nyus, Litovskiy Matematicheskiy Sbornik, Vol 13, No 3, 1973, pp 119 - 139

In the second section the discussion of systems in which $f^a(x^i, u^a, \frac{x^i}{u^a}) = 0$ is extended to show that the geometry of such a system is a first-order ray V_{n+m+nm} . The structural equations of this first-order ray space and the differential equations satisfied by the values which form the object of affine and linear differential-geometric connectivities were partially given by the author in No 3, Vol 10, of this journal. It can be shown that the object of the linear differential-geometric connectivity and the affine connectivity are covered by a fundamental differential-geometric object or its differential extension given in the article; that is, the object of linear differential-geometric connectivity is covered by the fundamental differential-geometric object of the space V_{n+m+nm} while the objects of affine connectivity are covered by its first differential extension.

2/2

- 9 -

USSR

UDC 621.774:539.4.014.3

MONOSHKOV, A. N., LUPIN, V. A., KUTEPOVA, V. I., NIKULIN, Yu. N., Urals
Scientific Research Institute for the Pipe Industry, Chelyabinsk

"Estimation of Limiting Pressure in Wrapped Pipes with Axial Loads"

Moscow, Stroitel'stvo Truboprovodov, No 2, Feb. 1973, pp 10-12.

Abstract: Wrapping of large diameter pipes significantly increases their resistance to large ruptures and in many cases allows a reduction in metal consumption. This article presents a method for estimation of the maximum pressure in wrapped pipes loaded with both internal pressure and axial forces which change in direct proportion to the pressure. Calculations are performed for thin wall pipes, the wrapping of which accepts only circumferential forces. The axes of the primary stresses and deformations are assumed to coincide with the geometric axes of the pipe. Analysis shows that as the axial compressive forces increase, the effectiveness of wrapping increases significantly.

1/1

1/2 007 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--UPTAKE AND USE OF MINERAL NUTRIENTS BY CEREAL CROPS ON PEAT BOG
SOILS -U-
AUTHOR--(02)-LUPINOVICH, I.S., KHAPKINA, Z.A.
COUNTRY OF INFO--USSR
SOURCE--AGROKHIMIYA 1970, (1), 33-8
DATE PUBLISHED-----70
SUBJECT AREAS--AGRICULTURE
TOPIC TAGS--PHOSPHORUS FERTILIZER, SOIL TYPE, CEREAL CROP
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1993/0329 STEP NO--UR/0485/70/000/001/0033/0038
CIRC ACCESSION NO--AP0113255

UNCLASSIFIED

2/2 007

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0113255

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WINTER RYE AND BARLEY WERE GROWN ON A PEAT BOG SOIL FERTILIZED WITH SUPERPHOSPHATE AND 40PERCENT K SALT. N, P, AND K CONTENTS WERE DETD. IN PLANTS AT THE END OF THE GROWTH PERIOD. THE N CONTENT OF PLANTS WAS USUALLY MUCH GREATER THAN THAT OF P OR K. IN LOWLAND, FERTILIZATION INCREASED THE CONTENT OF P IN GRAIN AND STRAW WHILE THAT OF K REMAINED UNCHANGED. THE STRAW TO GRAIN RATIOS WERE 1.64-2.40 AND 1.73-1.79 IN BARLEY AND RYE, RESP. THE UPTAKE OF N AND P BY BARLEY WAS 40-50 AND 6-10 KG-TON OF GRAIN RESP., IN OLD ARABLE SOILS AND SLIGHTLY LESS IN LOWLANDS; THAT OF K VARIED SUBSTANTIALLY. THE UPTAKE OF N, P, AND K BY RYE WAS 37-40, 13-15, AND 26-40 KG-TON OF GRAIN. THE USE OF AVAILABLE P FROM SOIL SOURCES AND FROM FERTILIZERS WAS 9-19 AND 6-25PERCENT, RESP., THE USE OF AVAILABLE K WAS 14-27 AND 30-52PERCENT, RESP.; IN LOWLANDS IT WAS USUALLY LESS. FACILITY: NAUCH.-ISSLED. INST. POCHVOVED. AGROKHM., MINSK, USSR.

USSR

UDC 624.131.43+539.21.084-492.3

LESHCHINSKIY, V. M., LUPINSKIY, M. I., OKUNEVSKIY, L. N.

"Experimental Study of the Joint Operation of Fastenings of Concrete Plates and Soils of the Surface of a Slope Under Wave Action"

Tr. Khar'kov. otd. vod. kh-va prom-predpriyatiy VNII VODGEO (Works of the Khar'kov Department of Water Economy of Industrial Enterprises of the All-Union Scientific Research Institute of Water Supply, Sewer Systems, Hydraulic Engineering Structures and Engineering Hydrogeology), 1971, No. 9, pp 48-57 (from RZh-Mekhanika, No 3, Mar 72, Abstract No 3V903)

Translation: Experimental studies of the deformations of fastening plates and the surface of soil slopes under the plates are described. The studies were conducted in laboratory molds at a height of the slopes of up to 1.25 m with sectional plates $0.8 \times 0.8 \times 0.06$ m and a monolithic plate $5.0 \times 1.5 \times 0.06$ m for three forms of soil and various densities of the soil and also in the presence of reverse filters of various thickness and granular composition. The purpose of the study was to evaluate the process of forced interaction of the fastening in the soil of the bank under shock (brief) rise in pressure from

1/2

USSR

LESHCHINSKIY, V. M., et al, Tr. Khar'kov. otd. vod. kh-va prom-predpriyatiy
VNII VODGEO, 1971, No. 9, pp 48-57

a breaking of waves. This action was simulated by shock loads caused by a dropping load. The authors emphasize that the intensity of the tremors (acceleration of vibrations) of the plates and ground reproduced in the experiments in the zone of impact corresponded to the intensity of tremors under the action of waves of a certain (calculated) height measured in nature. The forms of the deformations of the plates and earth slopes are given. The displacements of the plates and soils as a function of thickness in the form of the fastening plates, and the magnitude of the displacements as functions of the initial density of the soil and the thickness of the filter preparation, etc. are discussed. P. D. Yefdokimov.

USSR

UDC 531.768

LUPINSKIY, M. M., SAVITSKIY, F. S., and GAYUN, V. V.

"Threshold Elastic-Contact Accelerometers"

Moscow, Vibratsion. tekhnika (Vibration Engineering) 1972, pp 98-101 (from Referativnyy Zhurnal -- Metrologiya i Izmeritel'naya Tekhnika, No 1, 1973, Abstract No 1.32.407)

Translation: For determining only the peak value of acceleration, type-UKA accelerometers were developed, whose action is an elastic-contact method of acceleration measurement. The basic design elements of the elastic-contact accelerometer are elastic inertial bodies with spherical faces and flat, elastic bases. Both elements are prepared from high-grade steel with a yield point of $1.5-1.7 \times 10^9$ newtons/m² and tempered to a hardness of NRS 62-65. The smoothness of the contact surfaces must be lower than 10, and the accuracy of preparation of spheres and planes not less than 2-5 newton rings. The UKA design ensures the measurement of the vectors of acceleration and their three components. UKA is suitable for measuring peak values of acceleration from 10^4 to 10^6 m/sec² for a process duration of 2×10^{-4} sec and greater. (1 illustration, 5 bibliographic entries)

1/1

- 78 -

Ion Exchange

USSR

~~LUPINOV, I. N.~~, KAZANTSEV, Ye. I., and KOSAREV, V. M., Ural'sk Polytechnic
Institute imeni S. M. Kirov

"Chemical Stability of the Carboxyl Cation KB-4 X 7 in N-Form"

Ivanovo, Izvestiya Vysshikh Uchebnykh Zavedeniy, Khimiya i Khimicheskaya
Tekhnologiya, Vol XII, No 11, 1970, pp 1,607-1,611

Abstract: One of the requirements placed upon ion-exchange resins in daily
use is that they be chemically resistant to the action of bases, acids and
oxidizers, and knowledge of such resistance is critical in the choice of
ionite for particular problems; but research in this area has been unsyste-
matic and incomplete.

The authors studied the action of solutions of HNO_3 , H_2O_2 , $(\text{NH}_4)_2\text{S}_2\text{O}_8$, $\text{K}_2\text{Cr}_2\text{O}_7$
and KBrO_3 on the carboxyl cation KB-4 X 7 at temperatures of 18, 50 and 80°C.

It was found that the stability of the cation in these solutions depends both
upon the nature of the oxidizer and the temperature. In the case of H_2O_2 and
 $(\text{NH}_4)_2\text{S}_2\text{O}_8$ in an acid medium at 18°C, decarboxylation occurs, resulting in

1/2

USSR

LUPINOV, I. N., et al, Izvestiya Vysshikh Uchebnykh Zavedeniy, Khimiya i Khimicheskaya Tekhnologiya, Vol XII, No 11, 1970, pp 1,607-1,611

the cation losing some of its iogenic groups. In the case of HNO_3 , H_2O_2 and KBrO_3 in an acid medium at 50 and 80°C, there is oxidation of the cation matrix with formation of additional carboxyl groups. Finally, with oxidation by $\text{K}_2\text{Cr}_2\text{O}_7$ and $(\text{NH}_4)_2\text{S}_2\text{O}_8$, there is a sharp increase in swelling of the action.

2/2

- 23 -

USSR

UDC 621.314.57

SOKOLOV, S.D., BEY, YU.M., DOBROVOL'SKIS, T.P., LUPYAN, A.G., FIRSOVA, L.D.,
AYZENSHTEYN, L.S., GURAL'NIK, YA. D.

"System Of Control Of Thyristorized Inverter"

Tr. VNII Zh.-d. transp. (Works Of The All-Union Scientific-Research Institute Of Railroad Transportation), 1970, Issue 420, pp 69-85 (from RZh--Elektronika i yeye primeneniye, No 4, April 1971, Abstract No 4B665)

Translation: The paper describes a system of control of thyristorized converters [sic] arranged according to the circuit "two reverse stars with an equalizing reactor" or according to a 3-phase bridge scheme which assures turn-on of a large number of series-parallel connected thyristors. In the control circuit, individual (for each thyristor) output current transformers are used. This assures high efficiency and makes it possible to obtain identical currents through the thyristor gates with a considerable dispersion of their input characteristics. The circuit for pulse shaping consists of two 3-loop networks and a discharge thyristor. The first loop produces a steep initial burst, and the remainder the necessary duration of the control pulse. The experimental characteristics are considered of the pulse shapers with various parameters of the current of the output transformers, parameters of the thyristors, and length of the connecting conductors. A block diagram is presented of the modeling on an analog computer of the system for control of thyristors. 10 ill. 2 tab. 4 ref. L.R.

Instruments and Measurements

USSR

UDC: 621.316.92:621.314.6

FIRSOVA, L. D., SOKOLOV, S. D., LUPYAN, A. G., KISHINEVSKIY, R. N., KISELEV, N. M.,
Design and Planning Office of the Main Administration of Electrification and
Power Management of the Ministry of Ways of Communication

"A Device for Protection and Signalling the Breakdown of Diodes in a Semiconductor
Rectifier Installation"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 6,
1970, p 55, patent No 262248, filed 15 Apr 64

Abstract: This Author's Certificate introduces a device for protection and signalling the breakdown of diodes in a semiconductor rectifier installation with diodes connected in series-parallel. The unit contains shunting resistors and signal elements such as light bulbs which act on photoresistors connected in the input circuits of protection and alarm. As a distinguishing feature of the patent, the operational reliability of the device is improved by connecting the signal elements between the common points of groups of parallel-connected diodes and shunting resistors.

1/2